

Recent Papers by IBM Authors

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- Papers are listed alphabetically by name of journal.

A

Theory of Simple Mixtures, D. Henderson (RES San Jose, CA), *Annual Review of Physical Chemistry* 25, 461-483 (1974).

Enhancement of Transverse Thermoelectric Voltages in Thin Metallic Films, R. J. von Gutfeld and H. L. Caswell (RES Yorktown Hts., NY), *Applied Physics Letters* 25, No. 12, 691-693 (December 15, 1974).

Impact Ionization Model for Dielectric Instability and Breakdown, T. H. DiStefano (RES Yorktown Hts., NY) and M. Shatzkes (SPD East Fishkill, NY), *Applied Physics Letters* 25, No. 12, 685-687 (December 15, 1974).

Stabilization of the High-Temperature Phase of MnBi by the Addition of Rhodium or Ruthenium, K. Lee, J. C. Suits and G. B. Street (RES San Jose, CA), *Applied Physics Letters* 26, No. 2, 27-28 (January 15, 1975).

Silicon Nitride Trap Properties as Revealed by Charge-Centroid Measurements on MNOS Devices, P. C. Arnett and B. H. Yun (RES Yorktown Hts., NY), *Applied Physics Letters* 26, No. 3, 94-96 (February 1, 1975).

Connections and Disconnections on Integrated Circuits Using Nanosecond Laser Pulses, P. W. Cook, S. E. Schuster, and R. J. von Gutfeld (RES Yorktown Hts., NY), *Applied Physics Letters* 26, No. 3, 124-126 (February 1, 1975).

Wavelength and Intensity Tracking System, A. Onton and R. E. Fern (RES San Jose, CA), *Applied Spectroscopy* 28, No. 6, 558-563 (November/December 1974).

Roothaan-Hartree-Fock Atomic Wavefunctions, Basic Functions and Their Coefficients for Ground and Certain Excited States of Neutral and Ionized Atoms, $Z \leq 54$, E. Clementi and C. Roetti (RES San Jose, CA), *Atomic Data and Nuclear Data Tables* 14, No. 3/4, 177-478 (September/October 1974).

B

Reflection and Transmission of Inhomogeneous Waves with Particular Application to Rayleigh Waves, L. E. Alsop and A. S. Goodman (RES Yorktown Hts., NY) and S. Gregersen (Columbia Univ., New York City), *Bulletin of the Seismological Society of America* 64, No. 6, 1635-1652 (December 1974).

C

Pseudouniverses and Conjugate Gradients, M. R. Hestenes (RES Yorktown Hts., NY), *Communications of the Association for Computing Machinery* 18, No. 1, 40-43 (January 1975).

Storage-Efficient Representation of Decimal Data, T. C. Chen (RES San Jose, CA) and I. T. Ho (SPD East Fishkill, NY), *Communications of the Association for Computing Machinery* 18, No. 1, 49-52 (January 1975).

Connections Between Accuracy and Stability Properties of Linear Multistep Formulas, W. Liniger (RES Yorktown Hts., NY), *Communications of the Association for Computing Machinery* 18, No. 1, 53-56 (January 1975).

Multiplications Aleatoires Iterees et Distributions Invariantes par Moyenne Ponderee Aleatoire (Iterated Random Multiplications and Distributions Invariant under Random Averaging), B. B. Mandelbrot (RES Yorktown Hts., NY), *Comptes Rendus* 278A, 289-292 (1974).

Design Technique for a Near-Field Communication System, A. A. Smith, Jr. (SDD Kingston, NY), *Computer Design* 13, No. 9, 85-88 (September 1974).

Critical Phenomena Near Structural Phase Transitions Studied by EPR, K. A. Müller (RES Zurich, Switzerland), *Ferroelectrics* 7, No. 1-4, 17-21, (1974).

Field-Induced Space-Charge Layer in Strontium Titanate, U. T. Höchli (RES Zurich, Switzerland), *Ferroelectrics* 7, No. 1-4, 237-239 (1974).

H

Syntactic Errors in Computer Programming, S. J. Boies and J. D. Gould (RES Yorktown Hts., NY), *Human Factors* 16, No. 3, 253-257 (June 1974).

An Exploratory Study of Computer Program Debugging, J. D. Gould (Carnegie-Mellon University, Pittsburgh, PA) and P. Drongowski (RES Yorktown Hts., NY), *Human Factors* 16, No. 3, 258-277 (June 1974).

I

Optimizing Program Placement in Virtual Systems, K. D. Ryder (SDD Kingston, NY), *IBM Systems Journal* 13, No. 4, 292-306 (1974).

Note On Inherent and Imposed Priorities in Packet Switching, M. McDonald (IBM Germany, Boeblingen) and H. Rudin (RES Zurich, Switzerland), *IEEE Transactions on Communications* COM-22, No. 7, 1678-1681 (July 1974).

On the Complexity of Strictly Nonblocking Concentration Networks, N. Pippenger (RES Yorktown Hts., NY), *IEEE Transactions on Communications COM-22*, No. 7, 1890-1892 (July 1974).

An Example Computer Logic Graph and Its Partitions and Mappings, A. Mennone and R. L. Russo (RES Yorktown Hts., NY), *IEEE Transactions on Computers C-23*, No. 11, 1198-1204 (November 1974).

The Response of a Two-Wire Transmission Line Excited by the Nonuniform Electromagnetic Fields of a Nearby Loop, A. A. Smith, Jr. (SDD Kingston, NY), *IEEE Transactions on Electromagnetic Compatibility EMC-16*, No. 4, 196-200 (November 1974).

Variable-Length Encoding of Fixed-Rate Markov Sources for Fixed-Rate Channels, F. Jelinek (RES Yorktown Hts., NY) and K. S. Schneider (MIT Lincoln Lab, Lexington, MA), *IEEE Transactions on Information Theory IT-20*, No. 6, 750-755 (November 1974).

Stripe and Cylindrical Domains in Amorphous Co-P and Co-Ni-P Films, G. S. Cargil III (Yale University, New Haven, CT), R. J. Gambino and J. J. Cuomo (RES Yorktown Hts. NY), *IEEE Transactions on Magnetics 10*, No. 3, 803-806 (September 1974).

Guidelines for Project Management Teams, L. A. Rogers (SPD Endicott, NY), *Industrial Engineering 6*, No. 12, 12-19 (December 1974).

Systematic Cost Reduction, A. M. Segar (FSD Owego, NY), *Industrial Engineering 7*, No. 2, 14-17 (February 1975).

Modern Techniques Reveal Ceramic Surfaces: Explore/Examine, G. C. Phillips, J. F. Cain and R. C. Sanwald (SPD Endicott, NY), *Industrial Research 16*, No. 13, 46-50 (December 1974).

SETL Implementation: Data Structures, Primitives, and Storage Management, H. S. Warren, Jr. (RES Yorktown Heights, NY), *International Journal of Computer Mathematics 4*, No. 1, 77-79 (1974).

J

System Error Analysis and the Interactive Terminal, H. Land, Jr. and C. J. Standish (FSD Owego, NY), *Journal of the Alabama Academy of Science 45*, No. 2, 181-191 (April 1974).

Self-Consistent Field Calculations of Hole States of Carbon Monoxide. Electron Density Functions by Computer Graphics, J. Cambray, J. Gasteiger, A. Streitwieser, Jr., and P. S. Bagus (RES San Jose, CA), *Journal of the American Chemical Society 96*, No. 19, 5978-5985 (September 18, 1974).

Picosecond Studies of the Excited Charge-Transfer Interactions in (Anthracene)-(CH₂)₃-(N,N-Dimethylaniline) Systems, T. J. Chuang, R. J. Cox, and K. B. Eisenthal (RES San Jose, CA), *Journal of the American Chemical Society 96*, No. 22, 6828-6831 (October 30, 1974).

Structure Control in Organic Metals. Synthesis of Tetrasalenofulvalene and its Charge Transfer Salt with Tetracyano-(pi)-Quinodimethane, E. M. Engler and V. V. Patel (RES Yorktown Hts., NY), *Journal of the American Chemical Society 96*, No. 23, 7376-7378 (November 13, 1974).

On the Interpretation of Dislocation Contrast in X-ray Topographs of GaAs_{1-x}P_x, S. Mader, A. E. Blakeslee, and J. Angilello (RES Yorktown Hts., NY), *Journal of Applied Physics 45*, No. 11, 4730-4734 (November 1974).

The Sputtering of Chemisorbed Gas (Nitrogen on Tungsten) by Low-Energy Ions, H. F. Winters and P. Sigmund (RES San Jose, CA), *Journal of Applied Physics 45*, No. 11, 4760-4766 (November 1974).

Surface Reactions on MOS Structures, E. I. Alessandrini, D. R. Campbell, and K. N. Tu (RES Yorktown Heights, NY), *Journal of Applied Physics 45*, No. 11, 4888-4889 (November 1974).

Steady State and Transient Heating of Narrow Conductor Lines on Garnet Substrates, R. D. Hempstead (SPD Yorktown Hts., NY), *Journal of Applied Physics 45*, No. 11, 5015-5017 (November 1974).

Optically Induced Injection of Hot Electrons into SiO₂, T. H. Ning and H. N. Yu (RES Yorktown Hts., NY), *Journal of Applied Physics 45*, No. 12, 5373-5378 (December 1974).

Effects on Interface Barrier Energies of Metal-Aluminum Oxide-Semiconductor (MAS) Structures as a Function of Metal Electrode Material, Charge Trapping, and Annealing, D. J. DiMaria (RES Yorktown Hts., NY), *Journal of Applied Physics 45*, No. 12, 5454-5456 (December 1974).

Percus-Yevick Equation of State for the Square-Well Fluid at High Densities, W. R. Smith (Dalhousie Univ., Halifax, N.S., Canada), D. Henderson (RES San Jose, CA), and R. D. Murphy (Memorial Univ., St. Johns', Newfoundland, Canada), *Journal of Chemical Physics 61*, No. 7, 2911-2919 (October 1, 1974).

A Theoretical Study of the Lithium Fluoride Molecule in Water, R. O. Watts (Australian National University, Canberra), E. Clementi and J. Fromm (RES San Jose, CA), *Journal of Chemical Physics 61*, No. 7, 2550-2555 (October 1, 1974).

Multiple Scattering Method Based on Overlapping Atomic Spheres with Application to the TCNO Molecule, F. Herman (RES San Jose, CA), A. R. Williams (RES Yorktown Hts., NY), and K. H. Johnson (MIT, Cambridge, MA), *Journal of Chemical Physics 61*, No. 9, 3508-3522 (November 1, 1974).

Defects in Epitaxial Multilayers I. Misfit Dislocations, J. W. Matthews and A. E. Blakeslee (RES Yorktown Hts., NY), *Journal of Crystal Growth 27*, 118-125 (1974).

The Temperature Dependence of Garnet Liquid Phase Growth Kinetics, R. Ghez and E. A. Giess (RES Yorktown Hts., NY), *Journal of Crystal Growth 27*, 221-226 (1974).

The Effects of Trace Amounts of Water on the Thermal Oxidation of Silicon in Oxygen, E. A. Irene (RES Yorktown Hts., NY), *Journal of the Electrochemical Society* **121**, No. 12, 1613-1616 (December 1974).

A Lattice Parameter Criterion for Miscibility Gaps in the III-V and II-VI Pseudobinary Solid Solutions, L. M. Foster (RES Yorktown Hts., NY), *Journal of the Electrochemical Society* **121**, No. 12, 1662-1665 (December 1974).

Improved Dielectric Reliability of SiO with Polycrystalline Silicone Electrodes, C. M. Osburn and E. Bassous (RES Yorktown Hts., NY), *Journal of the Electrochemical Society* **122**, No. 1, 89-92 (January 1975).

Conjunctive Concept Learning as Affected by Prior Relevance Information and Other Informational Variables, L. A. Miller (RES Yorktown Hts., NY), *Journal of Experimental Psychology* **103**, No. 6, 1220-1222, (December 1974).

Intermittent Turbulence in Self-Similar Cascades: Divergence of High Moments and Dimension of the Carrier, B. B. Mandelbrot (RES Yorktown Hts., NY), *Journal of Fluid Mechanics* **62**, 331-358 (1974).

Analysis and Design for Zero Impact Wear, P. A. Engel (SPD Endicott, NY), *Journal of Lubrication Technology (Trans. ASME Series F)* **96**, No. 3, 455-463 (July 1974).

The Wear Process Between Normally Impacting Elastic Bodies, P. A. Engel and R. G. Bayer (SPD Endicott, NY), *Journal of Lubrication Technology (Trans. ASME Series F)* **96**, No. 4, 595-604 (October 1974).

Persistent Internal Polarizations in Polyethylene Terephthalate Films, V. Pitting and E. Sacher (SPD Endicott, NY), *Journal of Macromolecular Science-Physics* **B9**, No. 3, 521-532 (1974).

Secondary Structural Motions in Polycarbonate. I. Dielectric Properties, E. Sacher (SPD Endicott, NY), *Journal of Macromolecular Science-Physics* **B10**, No. 2, 319-329 (1974).

Lorentz Covariance of the Yukawa₂ Quantum Field Theory, O. A. McBryan (University of Toronto, Canada) and Y. M. Park (RES Yorktown Hts., NY), *Journal of Mathematical Physics* **16**, No. 1, 104-110 (January 1975).

Static Determinacy in the Theory of Finite Width Foil Bearings, W. E. Langlois (RES San Jose, CA), *Journal de Mécanique et de Physique de l'Atmosphere* **41**, No. 1, 51-54 (March 1974).

Azide Photoresists for Projection Photolithography, N. J. Clecak and R. J. Cox (RES San Jose, CA) and W. M. Moreau (SPD East Fishkill, NY), *Journal of Polymer Science: Polymer Engineering and Science Edition* **14**, No. 7, 491-493 (July 1974).

Tensile Strength of Polyurethane and Other Elastomeric Block Copolymers, T. L. Smith (RES San Jose, CA), *Journal of Polymer Science: Polymer Physics Edition* **12**, No. 9, 1825-1847 (September 1974).

In-plant Education Develops Better Systems Analysts, L. A. Rogers (SPD Endicott, NY), *Journal of Systems Management* **25**, No. 11, 26-31 (November 1974).

Evidence for a Mobility Edge in Inversion Layers. II, F. Stern (RES Yorktown Hts., NY), *Journal of Vacuum Science and Technology* **11**, No. 6, 962-964 (November/December 1974).

The Influence of Sodium on the Si-SiO₂ Interface, T. H. DiStefano and J. E. Lewis (RES Yorktown Hts., NY), *Journal of Vacuum Science and Technology* **11**, No. 6, 1020-1024 (November/December 1974).

Single-Source Evaporation of Gadolinium-Cobalt Alloys, R. C. Taylor (RES Yorktown Hts., NY), *Journal of Vacuum Science and Technology* **11**, No. 6, 1148-1150 (November/December 1974).

L

Comment on a Publication by Bramanti et al. on Gravity Wave Detection, J. L. Levine (RES Yorktown Hts., NY), *Lettere al Nuovo Cimento* **11**, No. 4, 280-282 (September 28, 1974).

M

Optimization with an Approximate Lagrangian, P. J. Schweitzer (RES Yorktown Hts., NY), *Mathematical Programming* **7**, No. 2, 191-198 (October 1974).

Conductivity, Permittivity, and the Electrode Space-Charge of Nematic Liquid Crystals. Part ii, G. J. Sprokel (SPD East Fishkill, NY), *Molecular Crystals and Liquid Crystals* **26**, No. 1/2, 45-57 (1974).

N

Calculation of Electronic Structure of TCNQ Molecule by Self-Consistent Statistical-Exchange Multiple-Scattering Method, F. Herman and I. P. Batra (RES. San Jose, CA), *Nuovo Cimento* **23B**, No. 1, 282-291 (September 11, 1974).

Exchange and Correlation Contribution to One-Body Potential in Metallic Be, J. C. Stoddart and P. Stoney (Univ. of Sheffield, England), N. H. March (Imperial College, London), and I. B. Ortenburger (RES San Jose, CA), *Nuovo Cimento* **23B**, No. 1, 15-26 (September 11, 1974).

P

Matrix Variational Calculations of Electron Scattering by C, N, and O Atoms, L. D. Thomas, R. S. Oberoi, and R. K. Nesbet (RES San Jose, CA), *Physical Review B* **10**, No. 5, 1605-1611 (November 1974).

Lattice Vibrational Modes of Li₂GeO₃ Measured by Infrared and Raman Techniques, A. Lurio and G. Burns (RES Yorktown Hts., NY), *Physical Review B* **10**, No. 8, 3512-3517 (October 15, 1974).

Calculation of Dynamic Critical Properties from a Cluster Reaction Theory, K. Binder and D. Stauffer (RES Zurich, Switzerland), *Physical Review B* **10**, No. 9, 3853-3857 (November 1, 1974).

Model for Tricritical Points in Distortive Structural Phase Transitions, St. Sarbach, T. Schneider, and E. Stoll (RES Zurich, Switzerland), *Physical Review B* 10, No. 9, 3988-3989 (November 1, 1974).

Peierls Instability in Heisenberg Chains, E. Pytte (RES Yorktown Hts., NY), *Physical Review B* 10, No. 11, 4637-4642 (December 1, 1974).

Photoemission Spectroscopy—Correspondence between Quantum Theory and Experimental Phenomenology, P. J. Feibelman (State University of New York at Stony Brook) and D. E. Eastman (RES Yorktown Hts., NY), *Physical Review B* 10, No. 12, 4932-4947 (December 15, 1974).

Band Narrowing and Charge Transfer in Six Intermetallic Compounds, V. L. Moruzzi, A. R. Williams, and J. F. Janak (RES Yorktown Hts., NY), *Physical Review B* 10, No. 12, 4856-4862 (December 15, 1974).

Coupling of an Excited Molecule to Surface Plasmons, H. Morawitz and M. R. Philpott (RES San Jose, CA), *Physical Review B* 10, No. 12, 4863-4868 (December 15, 1974).

Effect of Crystal Damage on Superconductivity in the Transition Metal Layer Compounds, J. C. Tsang, M. W. Shafer, and B. L. Crowder (RES Yorktown Hts., NY), *Physical Review B* 11, No. 1, 155-162 (January 1, 1975).

Magnetic Properties of Ho-Co and Ho-Fe Amorphous Films, N. Heiman and K. Lee (RES San Jose, CA), *Physical Review Letters* 33, No. 13, 778-781 (September 23, 1974).

Cyclotron Resonance in a Molecular Crystal-Anthracene, D. M. Burland (RES San Jose, CA), *Physical Review Letters* 33, No. 14, 833-835 (September 30, 1974).

Photoemission Partial Yield Spectroscopic Determination of Unoccupied Intrinsic Surface States for Ge(111) and GaAs(110), D. E. Eastman and J. L. Freeouf (RES Yorktown Hts., NY), *Physical Review Letters* 33, No. 27, 1601-1604 (December 30, 1974).

Percolation in a Lattice System with Particle Interaction, H. Müller-Krumbhaar (RES Zurich, Switzerland), *Physics Letters* 50A, No. 1, 27-28 (November 4, 1974).

R

Ion Implantation—An Annotated Bibliography, A. H. Agajanian (SPD East Fishkill, NY), *Radiation Effects* 23, No. 2, 73-129 (1974).

XY Table and Tilting Stage for Scanning Electron Microscope (SEM), O. C. Wells (RES Yorktown Hts., NY), *Review of Scientific Instruments* 46, No. 1, 77-79 (January 1975).

S

Simulation Study of a Quick Service Take-out Restaurant, G. R. Thomas, Jr. (SDD Endicott, NY), *Simulation* 22, No. 5, 139-144 (May 1974).

Randall's Rationalized Ratios, G. E. Randall (RES Yorktown Hts., NY), *Special Libraries* 66, No. 1, 6-11 (January 1975).

Comments Regarding the Determination of the Structure of $c(2 \times 2)$ Sulfur Overlayers on Ni(001), J. E. Demuth, D. W. Jepsen, and P. M. Marcus (RES Yorktown Hts., NY), *Surface Science* 45, No. 2, 733-739 (October 1974).

T

Oxidation of 4,5-Dihydroxyhomocubane: Oxidative Cleavage of the Central Bond to Generate Tetracyclo (4.3.0.0^{3,9}.0^{4,7}) Nonane-2,5-Dione, R. D. Miller and D. L. Dolce (RES San Jose, CA), *Tetrahedron Letters*, No. 43, 3813-3816 (1974).

W

The "Bottomless Solder Bucket" Connector System, J. R. Getten, A. B. Strines, and J. F. Turner (SPD Endicott, NY), *Welding Journal* 53, No. 11, 696-702 (November 1974).

• Book abstracts

The New Way of Life in Production and Inventory Management, J. A. Orlicky (DPDHQ White Plains, NY), McGraw-Hill Book Co., Inc., New York, 1975.

This is a comprehensive treatment of the subject of time-phased material requirements planning (MRP), i.e., a computer-dependent set of techniques designed to perform a key function in production logistics planning. The MRP system converts a master production schedule into detailed requirements for each part and raw material and associates all quantities with data on timing, spanning a user-specified planning horizon; its outputs serve a triple purpose: inventory control, capacity planning, and priority (re)planning. The book progresses from perspectives to concepts, includes details of MRP logic and specifics on both user-interface and file-data considerations, and examines the impact of MRP from a management point of view.

The Program Development Process, Part 1: The Individual Programmer, J. D. Aron (SDD Gaithersburg, MD), Addison-Wesley Publishing Co., Inc., Reading, MA, 1974.

This book is intended to teach the *procedural* aspects of programming to the individual programmer, as a supplement to technological training. Chapters range from a history of the program development process to the uses of on-line terminals and include problem analysis and planning, program design, coding, and debugging and delivery. The chapter on coding covers top-down vs bottom-up programming, coding techniques, structured programs, performance, optimization, reliability, and maintenance. This book is the first of an expected twenty volumes in the Systems Programming Series, sponsored by IBM and published by Addison-Wesley.

Aufbau von Betriebssystemen (Structure of Operating Systems), P. G. Caspers (IBM Deutschland, Boeblingen), Walter de Gruyter & Co., Berlin and New York, 1974.

The structure of operating systems is described, which are systems implemented by using general programming techniques, such as lists, tables, etc. Starting with an explanation of some special hardware functions, the handling of interrupts is discussed as the central complex of each operating system. Data management, input/output processing, and loaders are parts that are always present. Descriptions of process management, job management, and systems control are also included.